



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/788,670	02/21/2001	Hartvig W.J. Ekner	1778.2110000 (MIPS 0113.0	6040
56074 7590 01/26/2007 STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER DO, CHAT C.	
			ART UNIT 2193	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 09/788,670	Applicant(s) EKNER ET AL.	
	Examiner Chat C. Do	Art Unit 2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 43-81 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 43-81 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/21/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is responsive to Amendment filed 11/21/2006.
2. Claims 43-81 are pending in this application. Claims 43, 55, and 69 are independent claims. In Amendment, claims 1-42 are cancelled and claims 43-81 are added. This Office Action is made final.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 43-81 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 43, the limitation "a carry propagation adder...output of the second array" is unclear because without further limitation of its dependent claim 44, the carry propagation adder must have three input in order to couple or receive three results from the first and second array. For examination purposes, the examiner considers the carry propagation adder having three inputs for receiving three outputs from the first and second array. Claims 55 and 69 have the same rejection.

Thus, claims 44-54, 56-68, and 70-81 are also rejected for being dependent on the rejected based claims 43, 55, and 69.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 43-81 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 43-81 cite a processor, medium, and system of having two different type of multiplications. In order for claims to be statutory, claims must include either a practical application or a concrete, useful, and tangible result. However, claims 43-81 merely disclose components for performing difference type of multiplications without disclosing a practical application or its tangible result. In addition, claims 55-68 are software per se. Therefore, claims 43-81 are directed to non-statutory subject matter.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 43, 50-55, 62-66, 69, and 76-81 are rejected under 35 U.S.C. 103(a) as being obvious over Choquette (U.S. 6,480,872) in view of Tong (U.S. 4,847,801).

Re claim 43, Choquette discloses in Figure 4 a processor (e.g. abstract and Figure 4 component 400) comprising: a first array that is used to perform arithmetic multiplication (e.g. 410), the first array having a first result output and a second result output (e.g. C and S result from 410); and a carry propagation adder having a first input and a second input (e.g. adder 512 with all the inputs into the adder), wherein the first input of the carry propagation adder is coupled to the first result output of the first array, and the second input of the carry propagation adder is coupled to the second result output of the first array (e.g. adder 512). Choquette fails to disclose in Figure 4 a second array that is used to perform binary polynomial multiplication, the second array having a third result output and it connects to the adder. However, Tong discloses in Figures 1-2 a second array that is used to perform binary polynomial multiplication, the second array having a third result output and it connects to the adder (e.g. abstract and Figure 2). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add a second array that is used to perform binary polynomial multiplication, the second array having a third result output and it connects to the adder as seen in Tong's invention into Choquette's invention because it would enable to perform multiplication in Galois field (e.g. col. 1 lines 5-10).

Re claim 50, Choquette further discloses in Figure 4 the first array is a 32-bit by 16-bit array (e.g. the first operand can be 32 in size in col. 4 lines 45-65).

Re claim 51, Choquette fails to disclose the second array is a 32-bit by 16-bit array. However, Tong discloses the second array is a 32-bit by 16-bit array (e.g. col. 2 lines 35-45). Therefore, it would have been obvious to a person having ordinary skill in

the art at the time the invention is made to add a second array is a 32-bit by 16-bit array as seen in Tong's invention into Choquette's invention because it would enable to perform multiplication in Galois field (e.g. col. 1 lines 5-10).

Re claim 52, Choquette further discloses in Figure 4 the processor performs 32-bit by 32-bit multiplication (e.g. the first operand can be 32 in size in col. 4 lines 45-65).

Re claim 53, Choquette further discloses in Figure 4 the processor multiplies a first operand and second operand to form a resultant value (e.g. A and B as input operands the CS as output resultant), the first operand being provided to a first input of the first array and the second operand being provided to a second input of the first array, and wherein the resultant value is available at an output of the carry propagation adder (e.g. CS are fed directly to the adder 512).

Re claim 54, Choquette fails to disclose in Figure 4 the processor multiplies a polynomial first operand and second polynomial operand to form a resultant value, the first polynomial operand being provided to a first input of the second array and the second polynomial operand being provided to a second input of the second array, and wherein the resultant value is available at an output of the carry propagation adder.

However, Tong discloses in Figures 1-2 the processor multiplies a polynomial first operand and second polynomial operand to form a resultant value, the first polynomial operand being provided to a first input of the second array and the second polynomial operand being provided to a second input of the second array, and wherein the resultant value is available at an output of the carry propagation adder (e.g. the input operands is A and B and the output is C). Therefore, it would have been obvious to a person having

ordinary skill in the art at the time the invention is made to add the processor multiplies a polynomial first operand and second polynomial operand to form a resultant value, the first polynomial operand being provided to a first input of the second array and the second polynomial operand being provided to a second input of the second array, and wherein the resultant value is available at an output of the carry propagation adder as seen in Tong's invention into Choquette's invention because it would enable to perform multiplication in Galois field (e.g. col. 1 lines 5-10).

Re claim 55, it is a computer-readable medium claim of claim 43. Thus, claim 55 is also rejected under the same rationale as cited in the rejection of rejected claim 43.

Re claim 62, it is a computer-readable medium claim of claim 50. Thus, claim 62 is also rejected under the same rationale as cited in the rejection of rejected claim 50.

Re claim 63, it is a computer-readable medium claim of claim 51. Thus, claim 63 is also rejected under the same rationale as cited in the rejection of rejected claim 51.

Re claim 64, it is a computer-readable medium claim of claim 52. Thus, claim 64 is also rejected under the same rationale as cited in the rejection of rejected claim 52.

Re claim 65, it is a computer-readable medium claim of claim 53. Thus, claim 65 is also rejected under the same rationale as cited in the rejection of rejected claim 53.

Re claim 66, it is a computer-readable medium claim of claim 54. Thus, claim 66 is also rejected under the same rationale as cited in the rejection of rejected claim 54.

Re claim 69, it is a system claim of claim 43. Thus, claim 69 is also rejected under the same rationale as cited in the rejection of rejected claim 43.

Re claim 76, it is a system claim of claim 50. Thus, claim 76 is also rejected under the same rationale as cited in the rejection of rejected claim 50.

Re claim 77, it is a system claim of claim 51. Thus, claim 77 is also rejected under the same rationale as cited in the rejection of rejected claim 51.

Re claim 78, it is a system claim of claim 52. Thus, claim 78 is also rejected under the same rationale as cited in the rejection of rejected claim 52.

Re claim 79, it is a system claim of claim 53. Thus, claim 79 is also rejected under the same rationale as cited in the rejection of rejected claim 53.

Re claim 80, it is a system claim of claim 54. Thus, claim 80 is also rejected under the same rationale as cited in the rejection of rejected claim 54.

Re claim 81, Choquette further discloses in Figure 4 operation of the multiply-divided unit is decoupled from operation of the execution unit (e.g. 116 in Figure 1).

9. Claims 48-49, 60-61, and 74-75 are rejected under 35 U.S.C. 103(a) as being obvious over Choquette (U.S. 6,480,872) in view of Tong (U.S. 4,847,801), as applied to claims 43, 55, and 69 respectively, in further view of Bhandal et al. (U.S. 6,711,602).

Re claims 48-49, Choquette in view of Tong fail to disclose in Figure 4 the first array includes a plurality of carry-save adders arranged in a Wallace tree structure array. However, Bhandal et al disclose in Figures 5-8 the arithmetic multiplier includes a Wallace tree multiplier array (e.g. all levels of CSA in Figure 7). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the arithmetic multiplier includes a Wallace tree multiplier array as seen in

Bhandal et al.'s invention into Choquette in view of Tong's invention because it would enable to reduce the circuitry complexity and increase the system performance in performing multiplication.

Re claim 60, it is a computer-readable medium claim of claim 48. Thus, claim 60 is also rejected under the same rationale as cited in the rejection of rejected claim 48.

Re claim 61, it is a computer-readable medium claim of claim 49. Thus, claim 61 is also rejected under the same rationale as cited in the rejection of rejected claim 49.

Re claim 74, it is a system claim of claim 48. Thus, claim 74 is also rejected under the same rationale as cited in the rejection of rejected claim 48.

Re claim 75, it is a system claim of claim 49. Thus, claim 75 is also rejected under the same rationale as cited in the rejection of rejected claim 49.

10. Claims 67-68 are rejected under 35 U.S.C. 103(a) as being obvious over Choquette (U.S. 6,480,872) in view of Tong (U.S. 4,847,801), as applied to claim 43, 55, and 69 respectively, in further view of Bair et al. (U.S. 6,066,178).

Re claims 67-68, Choquette in view of Tong fail to disclose the processor is embodied in hardware description language software wherein the language is one of Verilog hardware description language software and VHDL hardware description language software. However, Bair et al. disclose the processor is embodied in hardware description language software wherein the language is one of Verilog hardware description language software and VHDL hardware description language software (e.g. col. 3 lines 50-65). Therefore, it would have been obvious to a person having ordinary

Art Unit: 2193

skill in the art at the time the invention is made to add the processor is embodied in hardware description language software wherein the language is one of Verilog hardware description language software and VHDL hardware description language software as seen in Bair et al.'s invention into Choquette in view of Tong's invention because it would enable to automate design and synthesis of a digital multiplier in hardware (e.g. col. 1 lines 5-10).

Response to Arguments

11. Applicant's arguments with respect to claims 43-81 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 2193

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

January 20, 2007

Chat C. Do
Examiner
Art Unit 2193

Meng-Ai An
Supv. Examiner 1-22-07